

# **DEVELOPMENT OF WEB-BASED APPLICATION FOR MEDICAL SERVICE RESERVATION AT PKU MUHAMMADIYAH KUTOARJO**



**This Final Project is compiled as one of requiremnets to complete bachelor degree at  
the Department of Informatics Faculty of Communication and Informatics**

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**SCIENTIFIC PUBLICATION**

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### DEVELOPMENT OF INFORMATION SYSTEM FOR PATIENT MEDICAL SERVICES AT PKU MUHAMMADIYAH KUTOARJO

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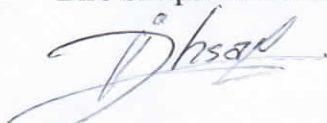
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DEVELOPMENT OF INFORMATION SYSTEM FOR PATIENT MEDICAL SERVICES  
AT PKU MUHAMMADIYAH KUTOARJO

**Abstract**

Health institutions such as hospitals always try to make improvements for the patient so that they feel more comfortable. One of the ways is developing an online reservation for medical service. This modern era, when everything is already computerized, is one reason why the application is built the revolution from analog to digital service system is something that cannot be avoided. With this change, the patient will be gradually facilitated for accessing health services. Besides, the efficiency of time is also included in the objective of this application. As well patients, physicians, and hospital staff are also facilitated through this progress. Patients can easily and efficiently perform the reservation without having to wait for the long queue at the hospital. The method used in this research to design the system is Waterfall method. Begins by analyzing the requirements of the system and ends with the application testing. Initially to acquire the necessary information for the research by interview with the hospital staff. After the data has been collected began the process of developing the application. Once the system is completed, patients can use the reservation page to get the queue for reservation and consul page to get answers directly from doctors or medical experts. From the black box testing, it can be seen that the system can run according to the functions and features that available such as login admin or users, process reservation, proses consultation and appovement from admin.

**Keywords:** efficient, hospital, medical reservation, online.

**1. INTRODUCTION**

People who come to the hospital usually would like to get quick and comfortable service. Hospital information systems are frequently created, designed and used, but supporters of the information

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# DEVELOPMENT OF INFORMATION SYSTEM FOR PATIENT MEDICAL SERVICES AT PKU MUHAMMADIYAH KUTOARJO

## Abstrak

Institusi kesehatan seperti rumah sakit selalu berusaha melakukan perbaikan untuk pasien sehingga mereka merasa lebih nyaman meski begitu PKU Muhammadiyah Kutoarjo. Salah satu caranya adalah mengembangkan reservasi online untuk layanan medis. Era modern ini, ketika semuanya sudah terkomputerisasi, adalah salah satu alasan mengapa aplikasi dari analog perlu diubah ke sistem layanan digital adalah sesuatu yang tidak dapat dihindari. Dengan perubahan ini, pasien akan secara bertahap difasilitasi untuk mengakses layanan kesehatan. Selain itu, efisiensi waktu juga termasuk dalam tujuan aplikasi ini. Selain pasien, dokter, dan staf rumah sakit juga difasilitasi melalui kemajuan ini. Pasien dapat dengan mudah dan efisien melakukan reservasi tanpa harus menunggu antrian panjang di rumah sakit. Metode yang digunakan dalam penelitian ini untuk merancang sistem adalah metode Waterfall. Dimulai dengan menganalisis persyaratan sistem dan berakhir dengan pengujian aplikasi. Awalnya untuk mendapatkan informasi yang diperlukan untuk penelitian dengan wawancara dengan staf rumah sakit. Setelah data terkumpul mulailah proses pengembangan aplikasi. Setelah sistem selesai, dilakukan pengujian sistem untuk mengetahui apakah hasil yang didapat tersebut sesuai dengan persyaratan. Hasil pengembangan aplikasi ini sendiri juga dapat menyederhanakan pemrosesan informasi dan data yang diperoleh untuk meningkatkan layanan yang ada dan karena aplikasi berbasis web dapat diakses di mana saja melalui berbagai perangkat dengan hanya mengakses internet.

**Keywords:** *efisien, reservasi medis, rumah sakit, online.*

## Abstract

Health institutions such as hospitals always try to make improvements for the patient so that they feel more comfortable even so PKU Muhammadiyah Kutoarjo. One of the ways is developing an online reservation for medical service. This modern era, when everything is already computerized, is one reason why the application is built the revolution from analog to digital service system is something that cannot be avoided. With this change, the patient will be gradually facilitated for accessing health services. Besides, the efficiency of time is also included in the objective of this application. As well patients, physicians, and hospital staff are also facilitated through this progress. Patients can easily and efficiently perform the reservation without having to wait for the long queue at the hospital. The method used in this research to design the system is Waterfall method. Begins by analyzing the requirements of the system and ends with the application testing. Initially to acquire the necessary information for the research by interview with the hospital staff. After the data has been collected began the process of developing the application. Once the system is completed, testing whether the system is in accordance with the requirements. The results of this application development itself also can simplify the processing of information and data obtained to improve existing services and because the web-based application can be accessed anywhere through variety of devices by only accessing the internet.

**Keywords:** *efficient, hospital, online, medical reservation.*

## 1. INTRODUCTION

People who come to the hospital usually would like to get quick and comfortable service. Hospital information systems are frequently created, designed and used, but supporters of the information and communication technology undermined the need to assess the systems independently (Emadi et al., 2017). In order to achieve this purpose, an information system for medical service reservation is developed. The method offered in this research is online reservations. Nowadays technology makes it easy for people to do numerous things. However, at some hospital like PKU Muhammadiyah Kutoarjo, some patients have to come early to perceive medical service. Since other patients also think the similar, this may cause the patients have to wait for the extra before their time scedule. Therefore, patients will not feel comfortable to wait for such a long time only for a checkup. Also, since many people come at the same time, the parking lot becomes full and over the capacity to occupy all vehicles. The hospital also needs exact number on how many patients that comes in a day for having medical services. On the other hand, the doctors also need to know how many people come for a checkup, so they can adjust the schedule.

As the development of technology today and considering the problem, this application is proposed to be developed to help the patient in making a reservation for medical services easily. The objective is to make the patients feel more comfortable to come to the hospital. This will help patients to get a schedule for a medical service without making a reservation in person to the hospital directly. Besides, because this is a web application, patients can access it comfortably using smartphone or computer. They also can check article or information about health and the hospital over the web page. Additionally, patients can decide what time they will go to the hospital according to their own the schedule. The doctor can offer some recommendation about health to patients who do not have enough time to meet the doctor directly as well.

The advantages of this application are that the patients do not have to wait too long for a checkup and the parking lot will be sufficient since patients will receive a message informing them time to come to the hospital. The patients will be asked to come fifteen minutes earlier before their appointed schedule. That will make them more comfortable to come to the hospital. The doctors also know how many people that will come, so they can manage the schedule for that day. The hospital is able to identify the exact number of patients that come for checkups and take the data from it. This application has a feature to help people who want to get simple advice about health from the doctor, so patients understand their own health. If they feel necessary to see the doctor for further consultation, then they just simply can make an online reservation. The



patients using this application will get a discount from the hospital, with the expectation that more people will use it.

## 2. METHOD

Application for medical service reservation at PKU Muhammadiyah Kutoarjo was created using XAMPP as software, PHP, and JavaScript for the programming language, MySQL and Firebase for storage data and Bootstrap for the framework. Firebase is a database backend for android, iOS and web applications. It creates a database and fetch from it in real time with only a few lines of code (Singh, 2016). This system is built for supporting hospital facilities. The aim is to facilitate the patient in obtaining medical treatment and comfortable in using it.

Intended for making this application through several stages or process in order to produce a better system and able to achieve the objectives of the system. The methodology used in this paper is Waterfall. According to Bassil (2011) The Waterfall model defines several consecutive phases that must be completed one after the other and moving to the next phase only when its preceding phase is completely done. The further explanation is illustrated in Figure 1 below.

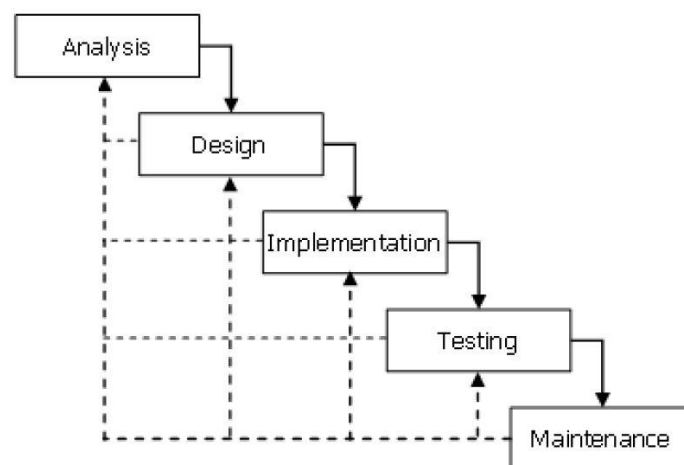


Figure 1. Waterfall Software Development Life Cycle Model

The picture shows the process circle, start from analysis to design, implementation, testing and then maintenance. If in the process errors occur, it can be fixing up from the previous step or from a process that needs to be repeated.

### 2.1 Analysis

Content analysis is a widely used research method for objective, systematic and quantitative examination of communication content ( Inhwa, & Kuljis, 2010). Requirement collecting and analysis stages are performed to collect data of doctors schedule and data related to hospital facilities that available as well as activities that take

place in the hospital that is intended for publication. The steps of handling patients who come to the hospital for checkup are explained in Figure 2.

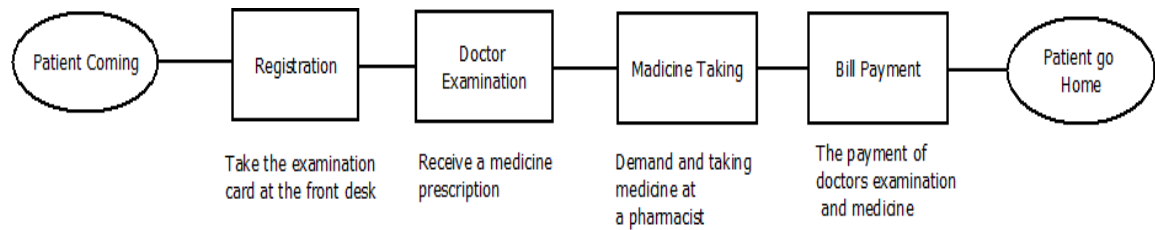


Figure 2. Way of handling Patients in hospital

This application is only operated by the receptionist to confirm the arrival of the patient. Afterward, the doctor will be informed about the schedule. The patient is examined by the on-duty doctor and receive medicines prescription. Then patients pay the bill and go home.

## 2.2 Design

The stage of System Design is described by using the use case diagram and interface layout.

### a. Use Case Diagram

The diagram figure for this application is described in Figure 3 as follow.

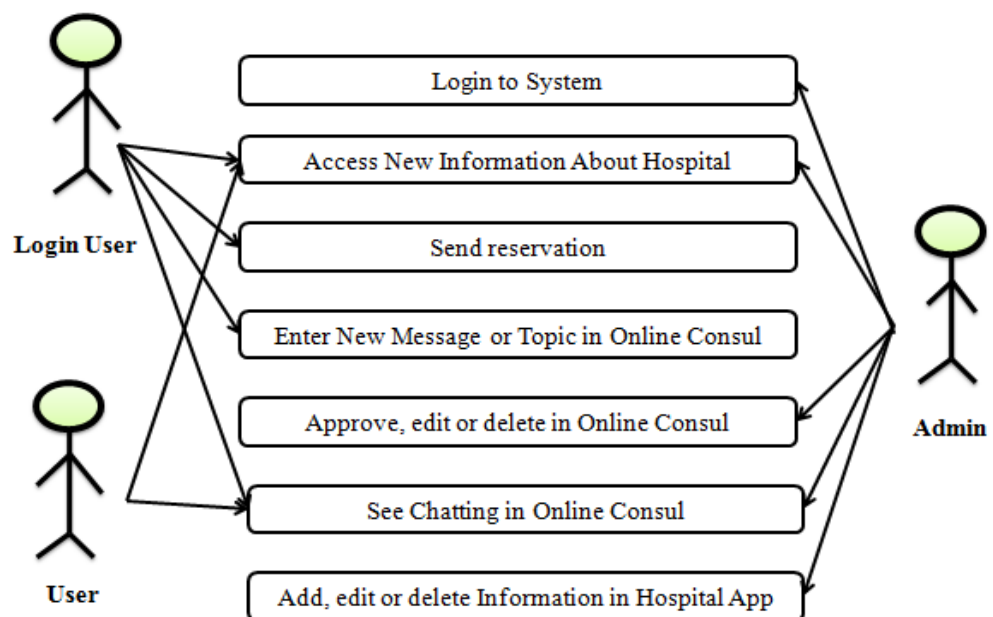


Figure 3. Use case diagram

From the picture we know that user divers into two type first is general user and second is login user. The difference is the login user can use the reservation page and enter new topics or message in online consul page.

b. Interface Layout

For illustration web view for user can be seen in figure 4.

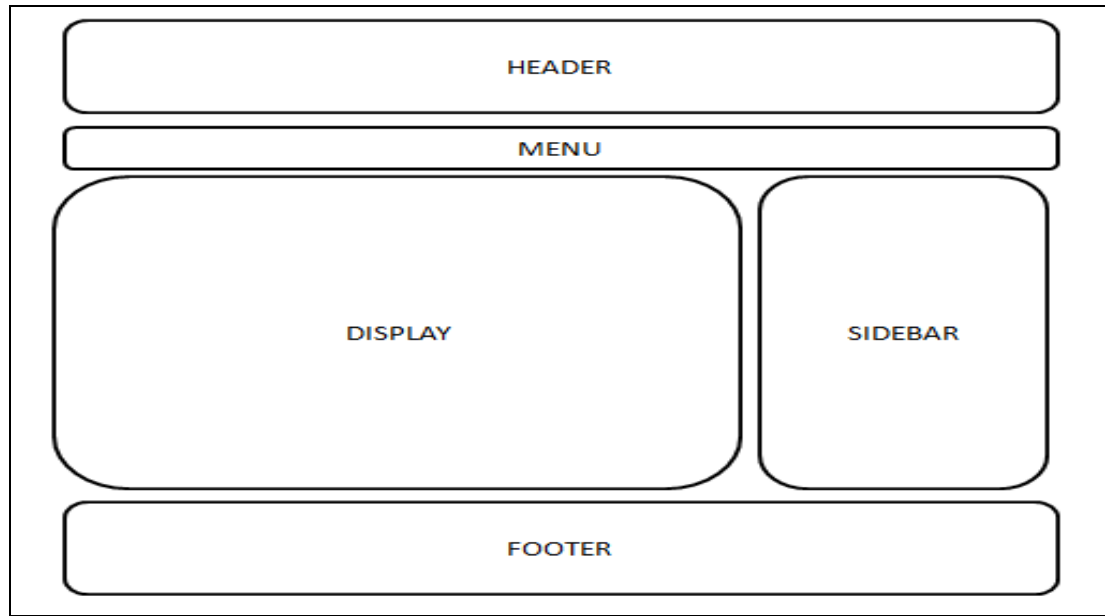


Figure 4. Web page view for users

For the users page, menu section is below the header section and the display and sidebar section side by side right after that. For the illustration on the admin view can be seen in figure 5.

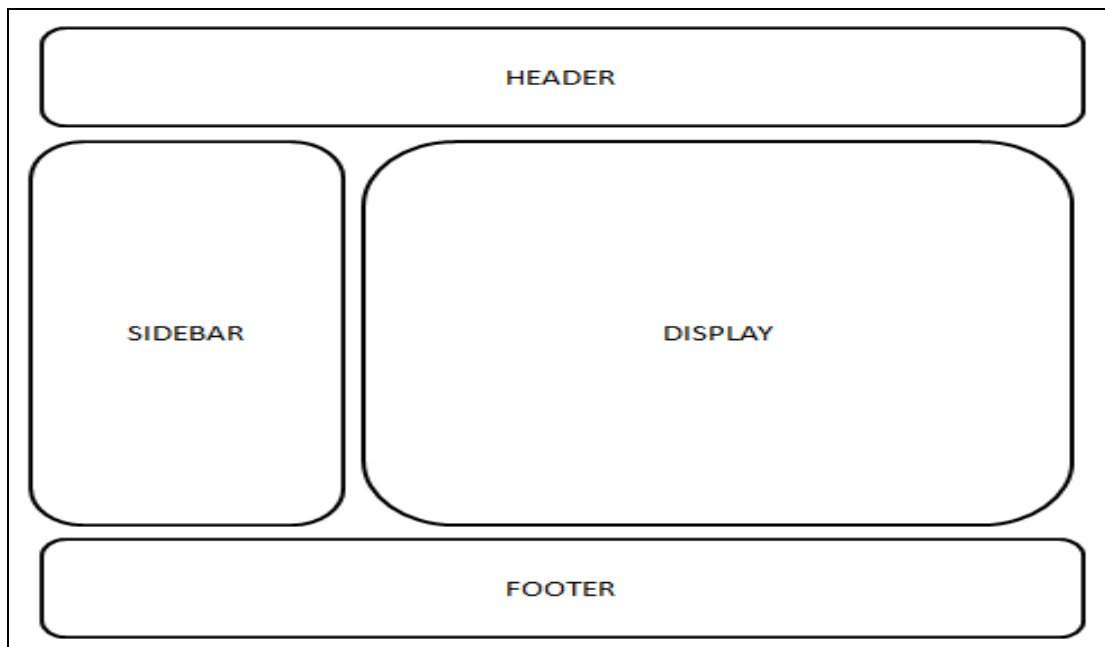


Figure 5. Web page view for admin

For the admin page, the display and sidebar section side by side before the header section and right after is footer section.

### **2.3 Implementation**

The application will be developed using several programming languages such as PHP, HTML, CSS, and Javascript to manage the web system. Bootstrap for designing the layout of the user interface. MySQL and Firebase as the database management and to manage the web system login for user using FirebaseUI for Web-Auth. With Firebase according to Kumar (2016), the database is used in this automation which makes us access from anywhere around the world. Software technology used to build applications including Sublime Text 2 and Notepad ++, XAMPP Control Panel v3.2.1 and Google Chrome web browser. After construction is complete, implementation of the application will be given to the hospital.

### **2.4 Testing**

System testing is done with process systems experiment. Like Boadu (2014) stated that employees play a crucial role in every organizational set-up. Achieving organizational goals cannot be done without human resources. Also the quality of responsive web design was tested from success factor in achieving responsive web design's purpose and the benefit of its use ( Lestari, 2014 ). Thus in this test we are working with the staff who later use this application and demonstrate how to use it.

### **2.5 Maintenance**

The system is provided for the user will experience a modification, because there is an adjustment or provision in the hospital undergoing development so that the system that is created must be able to adjust.

To build a system that is suitable and appropriate to the needs required several processes. The stages and processes depicted in figure 6 bellow.

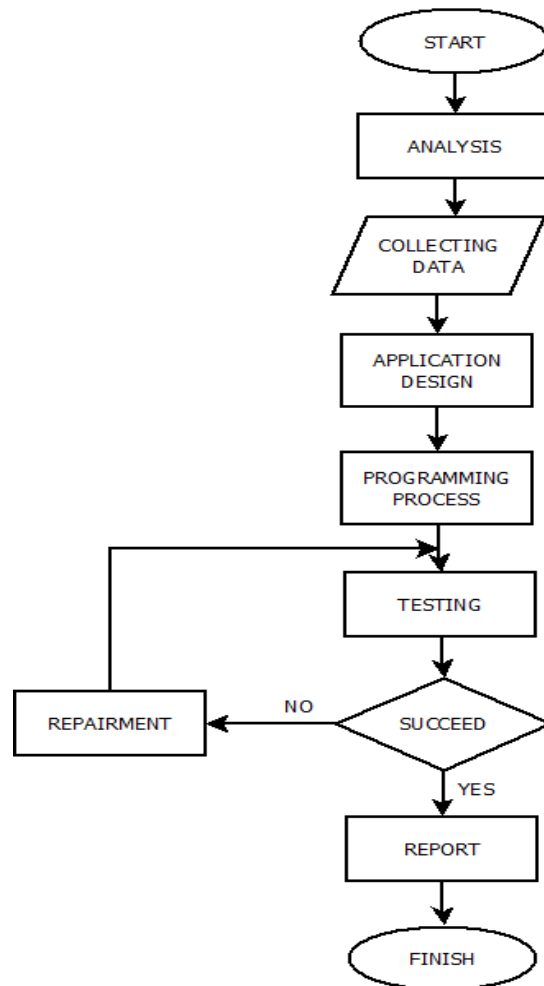


Figure 6. Program Flowchart

The first stage of the process is analysis of application to be constructed so that it can determine the appropriate requirements. Next is collection of data that are necessary in the development process. When it is deemed sufficient, began to building applications. The designing process includes making of databases, making the display design and system design for the application. Then start working on the writing program. If there are any errors in the testing process, section of the error will be repaired then retesting until correct. When it is fixed, proceed with the preparation of reports.

### 3. RESULT AND DISCUSSION

#### 3.1 Result

To use this app there are some things to be watchful. To begin with, the user is required to login first to be able to use the available functions. Requirements at login include a phone number that serves to send the code to be sent next. Then check on the captcha box and press verification button. This can be seen in figure 7 below.

\* silahkan langsung masukkan nomer telfon anda tanpa '0' didepannya



The image shows a login form titled "Masukkan nomor telepon Anda". It features a dropdown menu for the country code, currently set to "+62" with a small Indonesian flag icon. To the right of the dropdown is a text input field labeled "Nomor telepon". Below the input field is a reCAPTCHA box containing a checkbox labeled "Saya bukan robot" and the reCAPTCHA logo with links for "Privasi" and "Persyaratan". At the bottom of the form are two buttons: "BATAL" (light blue) and "VERIFIKASI" (dark blue). A disclaimer at the very bottom states: "Dengan menge-tap Verifikasi, SMS mungkin akan dikirim. Mungkin dikenakan biaya pesan & data."

Figure 7. Layout for login page

On the contrary, the consultation page can be viewed freely even without logging in, but to write a comment or add new topics the users still need to login first. For the consultation page and to enter a new topic or comment shown in Figure 8.

Home / Konsultasi	
Topik	xali
Tenggorokan	apa penyebab flu dan bagaimana cara mengatasinya? Ahad, 3 Juni 2018
jantung	dokter 1
penyebab pilek	Flu atau influenza adalah infeksi virus yang menyerang sistem pernapasan flu dapat diatasi dengan vaksinasi. Tetapi cara ini hanya dianjurkan bagi mereka yang lebih rentan mengalami komplikasi flu.
penyakit flu	Ahad, 3 Juni 2018
xl bikin topik baru	indro
hati	informasi yang sangat bermanfaat Ahad, 3 Juni 2018
	dokter 1
	fatia pushing
	Selasa, 10 Juli 2018

### Formulir Konsultasi

Nama

---

Pilih Topik

Pilih Topik

Topik Baru

☐ buat topik baru

Isi

Kirim

Figure 8. Consultation Page and Consultation Form

From the picture we can see if the request that we send from consultation form has been approved we can see it in consultation table above it and we can know if doctor answer the question is there are an answer with red color. For consultation form just pick the topics and input the question or make a new topic if the available one is not suitable for the content.

In the reservation form, the user must enter some terms such as the desired service then enter the desired date for treatment. The layout of the reservation form is in Figure 9 below.

The reservation form contains the following fields and elements:

- Nama Pasien:** Text input field containing "Wilda".
- No. Hp:** Text input field containing "+628179902567".
- Pilihan Layanan:** Dropdown menu.
- Tanggal:** Date selection field with a red asterisk indicating it is required.
- Waktu / Dokter:** Dropdown menu.
- Kirim:** Green button to submit the reservation.

Figure 9. Reservation Form

For insert in the reservation form, we have to log in first and chose the service that we want then chose date and doctor that available in order after that send the request.

In the consultation page of the user section will be sorted first before the publication to determine the content in accordance with the topic as well as spam messages. This can be seen in Figure 10 below.

Halaman Administrator						Preview	Keluar
<div> Beranda Menu Submenu Halaman Artikel Galeri Jadwal Layanan Reservasi Konsul Online </div>							
Data Konsul							
No	topik	Isi Pesan	Pengirim	Tanggal	Aksi		
1	jantung	jantung biar tak berdetak di gimana in?	Nani	Senin, 23 Juli 2018	hapus	sejutu	
2	penyakit flu	Fathiya pusing mul... flu burung flu ayam flu kaki flu bebek flu setres wkwk	Nani	Senin, 23 Juli 2018	hapus	sejutu	
3	jantung	obesitas	Nani	Sabtu, 4 Agustus 2018	hapus	sejutu	

Figure 10. Awaiting Consultations Approval



In approval page at admin page we have to select the request so there is no spam and if the user makes a mistake in choosing topics or we think the topics are not fits we can change it from here.

### 3.2 Discussion

Generally, the system can run according to function requirements although there are still some parts to be developed after. This application is expected to be able to help people who would like to perceive clarity before going to the hospital. Patient waiting time at the hospital can also struggle because it has made the schedule of hours when making a reservation. The result of the testing is as shown in Table 1 as follows.

Table 1. The System Testing Result

No.	Scenario	Test Case	Expectation	Result
1.	Login to system for admin and user	<ul style="list-style-type: none"> <li>- Login admin using username : admin and password : admin</li> <li>- Login user using phone number.</li> </ul>	<ul style="list-style-type: none"> <li>- For admin if username and password correct system will redirect to the admin page.</li> <li>- For user if the code can be sent appropriately system will redirect to the user page.</li> </ul>	Success
2.	Processing reservation data	Inputting the type of service desired, related doctor, date and time.	The patient gets notified if not login when sending reservation and if it successful patient will get a confirmation message.	Success
3.	Processing consultation data	Inputting the new topics, choose available topics and ask questions.	The user input sent may appear in the admin consultation page. If it is received, it can be seen in the user consultation page. But if it is rejected, it will be deleted.	Success
4.	Admin correct the request in the consultation section	Admin can approve or reject the consultation	Admin can select the request so if the user makes a mistake in choosing topics or admin think the topics are not fitted we can change it.	Success

#### 4. CONCLUSION

The results of the assessment show that the application is able to run well and when installed later will increase the ease of hospitals in terms of comfort as well. The patient can get maximum service and comfortably receive medical treatment because there is no group of patients who want to seek treatment at certain hours.

The results of this application development itself also can simplify the processing of information and data obtained to improve existing services and because the web-based application can be accessed anywhere through the variety of devices by only accessing the internet. From the black box testing, it can be seen that the system can run according to the functions and features that available such as login admin or users, process reservation, proses consultation and approvement from admin.

In spite of the assessment result, this application still needs improvements in the future to help the activities at the hospital easier. For further development, it can be added a sequence display function to the reservation section so that the hospital staff can identify whether the patients have arrived at the hospital or not.

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